ANCOM
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RO-IR UWB-02-1

TECHNICAL REGULATION

for the radio interface

concerning equipment using ultra-wideband (UWB) technology

(material sensing devices)

1. Basic considerations

Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC was implemented in national legislation by Government Decision No. 740/2016 on making available on the market of radio equipment.

This technical regulation contains the requirements for the use of licence exempt of equipment using ultra-wideband (UWB) technology (material sensing devices) in the specified frequency bands and considers especially compliance with the provisions of Article 3 Paragraph 2, and Articles 6, 7 and 8 of Directive 2014/53/EU.

Nothing in this technical regulation shall preclude the need for equipment placed on the market in Romania to comply with Directive 2014/53/EU.

The obligations arising from Directive (EU) 2015/1535 of the European Parliament and of the Council of 9 September 2015 laying down a procedure for the provision of information in the field of technical regulations and of rules on Information Society services have been met (OJ L 241, 17.9.2015, p. 1-15).

All Romanian technical regulations for the radio interfaces notified under Directive (EU) 2015/1535 will be published and will be made available on National Authority for Management and Regulation in Communications of Romania (ANCOM) web-site at: http://www.ancom.org.ro/reglementari-interfete_2723.

2. Radio Interface Specifications

UWB (material sensing devices)

Frequency range
Below 1.73 GHz
1.73 – 2.2 GHz
2.2 – 2.5 GHz
2.5 – 2.69 GHz
2.69 – 2.7 GHz
2.7 – 2.9 GHz
2.9 – 3.4 GHz
3.4 – 3.8 GHz
3.8 – 4.8 GHz
4.8 – 5 GHz
5 – 5.25 GHz
5.25 – 5.35 GHz
5.35 – 5.6 GHz
5.6 – 5.65 GHz
5.65 – 5.725 GHz
5.725 – 8.5 GHz
8.5 – 10.6 GHz
Above 10.6 GHz

For the purpose of this technical regulation, *equipment using ultra-wideband (UWB) technology* means equipment incorporating, as an integral part or as an accessory, a technology for short-range radio communication, involving the intentional generation and transmission of radio-frequency energy that spreads over a frequency band wider than 50 MHz, which may overlap several frequency bands allocated to radio communication services.

Maximum mean power spectral density, specified as e.i.r.p. of the radio device under test at a particular frequency, is the average power per unit bandwidth (centred on that frequency)

radiated in the direction of the maximum level under the specified conditions of measurement.

Peak power, specified as e.i.r.p., is the power contained within a 50 MHz bandwidth at the frequency at which the highest mean radiated power occurs, radiated in the direction of the maximum level under the specified conditions of measurement.

Total power spectral density means the average of the mean power spectral density values measured over a sphere around a detection scenario with a resolution of at least 15 degree. The detailed measuring setup is contained within ETSI standard EN 302 065-4.

Material sensing devices authorised under this technical regulation shall fulfil the following requirements:

Fixed installation (application A)
— The transmitter has to switch off if the machine is not running ("running sensor").
— The transmitter shall implement a TPC with a dynamic range of 10 dB, as described in the harmonised standard EN 302 065-4 for material sensing devices.
— The transmitter shall be attached to a fixed installation.

Non-fixed installation (application B)
— Transmitter-on only if manually operated with a non-locking switch (e.g. it may be a sensor for the presence of the operator's hand) plus being in contact or close proximity to the investigated material and the emissions being directed into the direction of the object (e.g. measured by a proximity sensor or imposed by the mechanical design).
— The transmitter has to switch off if the machine is not running ("running sensor").

For the purpose of this technical regulation, *non-interference and non-protected basis* means the interdiction that no harmful interference may be caused to any radio communications service and that no claim may be made for protection of these devices against harmful interference originating from radio communications services;

The use of radio spectrum by equipment using ultra-wideband technology (UWB) is allowed on a non-interference and non-protected basis provided that such equipment meets the conditions set out in the Annex and it is used indoors, or if it is used outdoors, it is not attached to a fixed installation, a fixed infrastructure or a fixed outdoor antenna.

3. Document history:

Edition	Changes
Edition 1/2015	Notification number according to Directive 98/34/EC: 2015/139/RO.
Edition 2/2018 (10.08.2018)	Update according to implementing Decision (EU) 2017/1438 amending Decision 2007/131/EC authorizing the use of radio spectrum for equipment using ultra-wideband technology in the Community under harmonized conditions; Update of the legal framework according to Point 1 – „Basic considerations" and reference documents (row 13); Formal changes according to TCAM-RSC model of November 2017.

<table>
<tr><th></th><th>Nr</th><th>Parameter</th><th>Description</th><th>Comments</th></tr>
<tr><td rowspan="8">Normative part</td><td>1</td><td>Radiocommunication Service</td><td>Mobile</td><td></td></tr>
<tr><td>2</td><td>Application</td><td>Short Range Devices / UWB applications</td><td>Material sensing devices</td></tr>
<tr><td>3</td><td>Frequency band</td><td>See row (7) below for applicable frequency bands</td><td>Harmonised radio spectrum for ultra-wideband technology (Implementing Decision (EU) 2017/1438 amending Decision 2007/131/EC authorizing the use of radio spectrum for equipment using ultra-wideband technology in the Community under harmonized conditions)</td></tr>
<tr><td>4</td><td>Channeling (channel distribution)</td><td>-</td><td></td></tr>
<tr><td>5</td><td>Modulation/Occupied bandwidth</td><td>-</td><td></td></tr>
<tr><td>6</td><td>Direction/Separation</td><td>-</td><td></td></tr>
<tr><td>7</td><td>Transmit power / Power density</td><td>
<table>
<tr><th rowspan="2">Frequency range</th><th colspan="2">Fixed installations (Application A)</th><th rowspan="2">Non-fixed installations (Application B) Maximum mean power spectral density (e.i.r.p)</th></tr>
<tr><th>Maximum mean power spectral density (e.i.r.p)</th><th>Maximum mean power spectral density (e.i.r.p) in the horizontal plane (– 20° to 30° elevation)</th></tr>
<tr><td>Below 1.73 GHz</td><td colspan="2">– 85 dBm/MHz</td><td>– 85 dBm/MHz</td></tr>
<tr><td>1.73 – 2.2 GHz</td><td>– 65 dBm/MHz</td><td>– 70 dBm/MHz</td><td>– 70 dBm/MHz</td></tr>
<tr><td>2.2 – 2.5 GHz</td><td colspan="2">– 50 dBm/MHz</td><td>– 50 dBm/MHz</td></tr>
<tr><td>2.5 – 2.69 GHz</td><td>– 65 dBm/MHz (1)</td><td>– 70 dBm/MHz</td><td>– 65 dBm/MHz (1) (2)</td></tr>
<tr><td>2.69 – 2.7 GHz</td><td>– 55 dBm/MHz</td><td>– 75 dBm/MHz</td><td>– 70 dBm/MHz (3)</td></tr>
<tr><td>2.7 – 2.9 GHz</td><td>– 50 dBm/MHz</td><td>– 70 dBm/MHz</td><td>– 70 dBm/MHz</td></tr>
<tr><td>2.9 – 3.4 GHz</td><td>– 50 dBm/MHz</td><td>– 70 dBm/MHz</td><td>– 70 dBm/MHz (1)</td></tr>
<tr><td>3.4 – 3.8 GHz</td><td>– 50 dBm/MHz</td><td>– 70 dBm/MHz</td><td>– 50 dBm/MHz (2) (3)</td></tr>
<tr><td>3.8 – 4.8 GHz</td><td colspan="2">– 50 dBm/MHz</td><td>– 50 dBm/MHz</td></tr>
<tr><td>4.8 – 5 GHz</td><td>– 55 dBm/MHz</td><td>– 75 dBm/MHz</td><td>– 55 dBm/MHz (2) (3)</td></tr>
<tr><td>5 – 5.25 GHz</td><td colspan="2">– 50 dBm/MHz</td><td>– 50 dBm/MHz</td></tr>
<tr><td>5.25 – 5.35 GHz</td><td>– 50 dBm/MHz</td><td>– 60 dBm/MHz</td><td>– 60 dBm/MHz</td></tr>
<tr><td>5.35 – 5.6 GHz</td><td colspan="2">– 50 dBm/MHz</td><td>– 50 dBm/MHz</td></tr>
<tr><td>5.6 – 5.65 GHz</td><td>– 50 dBm/MHz</td><td>– 65 dBm/MHz</td><td>– 65 dBm/MHz</td></tr>
<tr><td>5.65 – 5.725 GHz</td><td>– 50 dBm/MHz</td><td>– 60 dBm/MHz</td><td>– 60 dBm/MHz</td></tr>
<tr><td>5.725 – 8.5 GHz</td><td colspan="2">– 50 dBm/MHz</td><td>– 50 dBm/MHz</td></tr>
<tr><td>8.5 – 10.6 GHz</td><td colspan="2">– 65 dBm/MHz</td><td>– 65 dBm/MHz</td></tr>
<tr><td>Above 10.6 GHz</td><td colspan="2">– 85 dBm/MHz</td><td>– 85 dBm/MHz</td></tr>
</table>
</td><td>Emissions radiating from material sensing devices authorised under this technical regulation shall be kept to a minimum and in any case not exceed the e.i.r.p. density limits within the table. The compliance with the limits for non-fixed installations (application B) has to be ensured with the device on a representative structure of the investigated material (e.g. representative wall as defined in harmonised standard ETSI EN 302 065-4).
The peak power (in dBm) measured in a bandwidth of 50 MHz shall be less than a limit that is obtained by adding a conversion factor (25 dB) to the maximum mean power spectral density (in dBm/MHz) limit.
(1) Devices using a Listen Before Talk (LBT) mechanism, as described in the harmonised standard ETSI EN 302 065-4, are authorised to operate in frequency ranges 2.5 – 2.69 and 2.9 – 3.4 GHz, with a maximum mean power spectral density of – 50 dBm/MHz.
(2) To protect the radio services, non-fixed installations (application B) must fulfil the following requirements for total radiated power spectral density:
(a) in the frequency ranges 2.5 – 2.69 GHz and 4.8 – 5 GHz, the total radiated power spectral density has to be 10 dB below the maximum mean power spectral density;
(b) in the frequency range 3.4 – 3.8 GHz, the total radiated power spectral density has to be 5 dB below the maximum mean power spectral density.
(3) Limitation of the Duty Cycle to 10 % per second.</td></tr>
</table>

	8	**Channel occupation and access rules**	-	
	9	**Authorisation regime**	Licence exemption	
	10	**Additional essential requirements (According to Article 3 Paragraph 3 of 2014/53/EU Directive)**	-	
	11	**Assumptions on spectrum planning**	-	
Informative part	**12**	**Planned changes**	-	
	13	**Reference**	EN 302 065-4; Implementing Decision (EU) 2017/1438 amending Decision 2007/131/EC authorizing the use of radio spectrum for equipment using ultra-wideband technology in the Community under harmonized conditions	
	14	**Notification number**	-	
	15	**Remarks**	-	